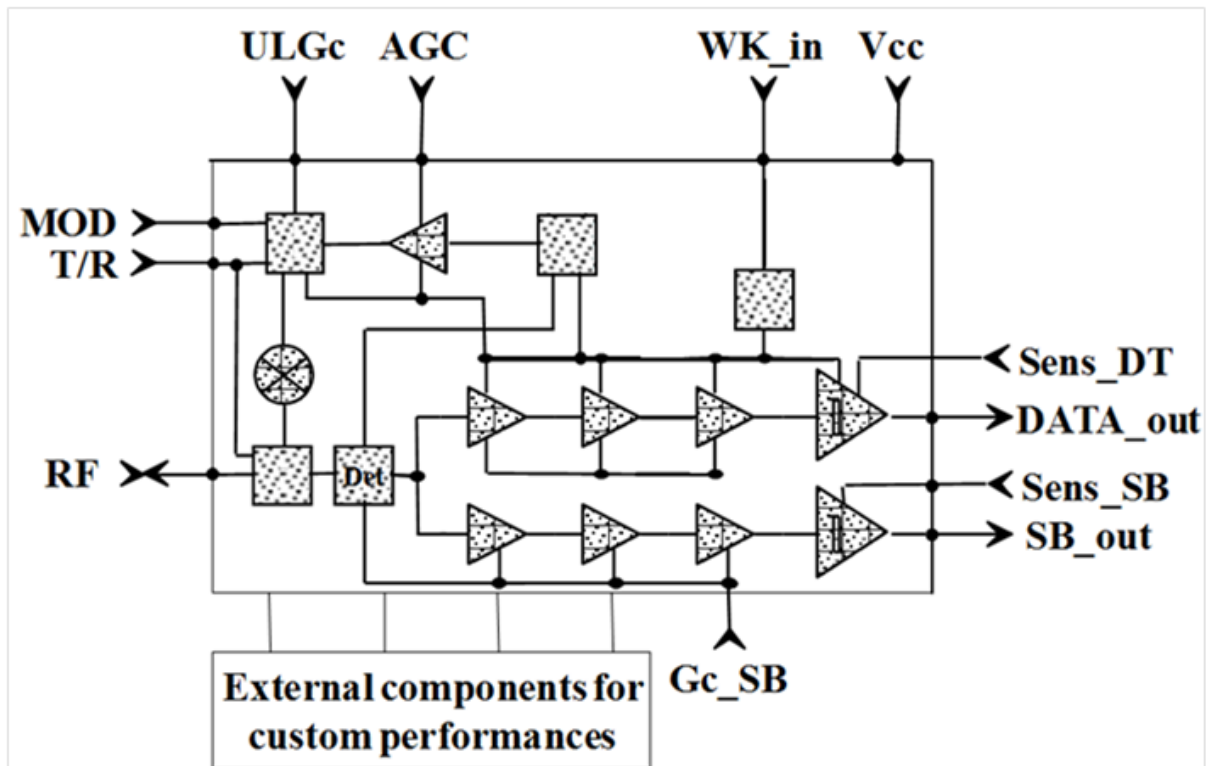


Advanced Information: AI1232

5.8GHz TRANSPONDER



Key features

- 5.8GHz ISM band operating frequency
- Single RF port and antenna for compact system
- Integrated wake-up circuit
- Low Standby current
- 3V battery bias voltage range oriented
- High wake-up selectivity
- Adjustable Standby time & threshold parameters
- High AM detection sensitivity for Downlink
- Adjustable Downlink parameters
- Digital output interfaces CMOS compatible
- High performance modulator for low Uplink losses
- -40°C to +90°C temperature range
- ESD protected
- High performances small leadless plastic package
- RoHS compliant

Electrical Characteristics

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
Vcc	Bias voltage		+2.7	+3	+3.2	V
Tsp	Specified Temperature range		-25	+25	+90	°C
Fop	Operating RF frequency range		5.72	5.8	5.88	GHz

STANDBY mode: T/R='0', MOD='0', WK_in='low'

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
RF_sb_bw	Amplitude modulation frequency of RF on RF port for wake-up		250		500	kHz
RF_sb_p_min (*)	Amplitude modulated RF minimum input power on RF port for wake-up	(1) (2)	-49	-44	-39	dBm
Vcc_sb_i (*)	Standby DC current	Without RF input signal			6.5	µA

(1) Total received power of the modulated signal (modulation index = 0.5).

(2) SB_Sn & R (on Sens_SB) as recommended to match -44dBm typical on a given wafers lot

(*) Note: Min & Max values include technological spreads, supply & temperature range effect.

DOWNLINK mode: T/R='0', MOD='0', WK_in='high'

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
Data_out_f_3dB	Amplitude demodulation 3dB frequency band		50		2000	kHz
Data_out_dc (*)	Data_out signal duty cycle		40	50	60	%
RF_dl_p_min(*)	Amplitude modulated RF minimum input power on RF port for downlink	(1)		-44	-39	dBm
WK_in_i (*)	WK_in DC current			0.25	.75	mA

(1) Total received power of the modulated signal (modulation index = 0.5).

(*) Note: Min & Max values include technological spreads, supply & temperature range effect.

Advanced Information

UPLINK mode: T/R='Vcc', WK_in='high'

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
MOD_f_3dB	Uplink IF multipliers 3dB frequency band		DC		30	MHz
G_ul_max (*)	RF uplink maximum conversion gain (DSB) (2)	RF_ul_p <-35dBm	-4.5			dB
G_ul_min (*)	Guaranteed minimum G_ul (DSB) (1)	RF_ul_p=-8dBm			-18	dB
UL_TSM	RF emitted maximum spurious level in 500kHz Rbw	@ Fop +/- 1.5, 2, 3, 3.5, 6.5, 7 MHz excluding Fop +/- MOD_f RF_ul_p=-8dBm Sub - carrier is pseudo random modulated as defined by ETSI			-39	dBm
WK_in_i (*)	WK_in DC current			1	2	mA

(1) $G_{ul} = \text{Function}(\text{RF}_{ul_p})$

(2) $G_{ul} = \text{Emitted_Power}(\text{RF port @ (Fop + MOD_f)}) + \text{Emitted_Power}(\text{RF port @ (Fop - MOD_f)}) - \text{Incident_Power}(\text{RF port @ Fop})$

(*) Note: Min & Max values include technological spreads, supply & temperature range effect

Advanced Information

Absolute Maximum Ratings ⁽¹⁾

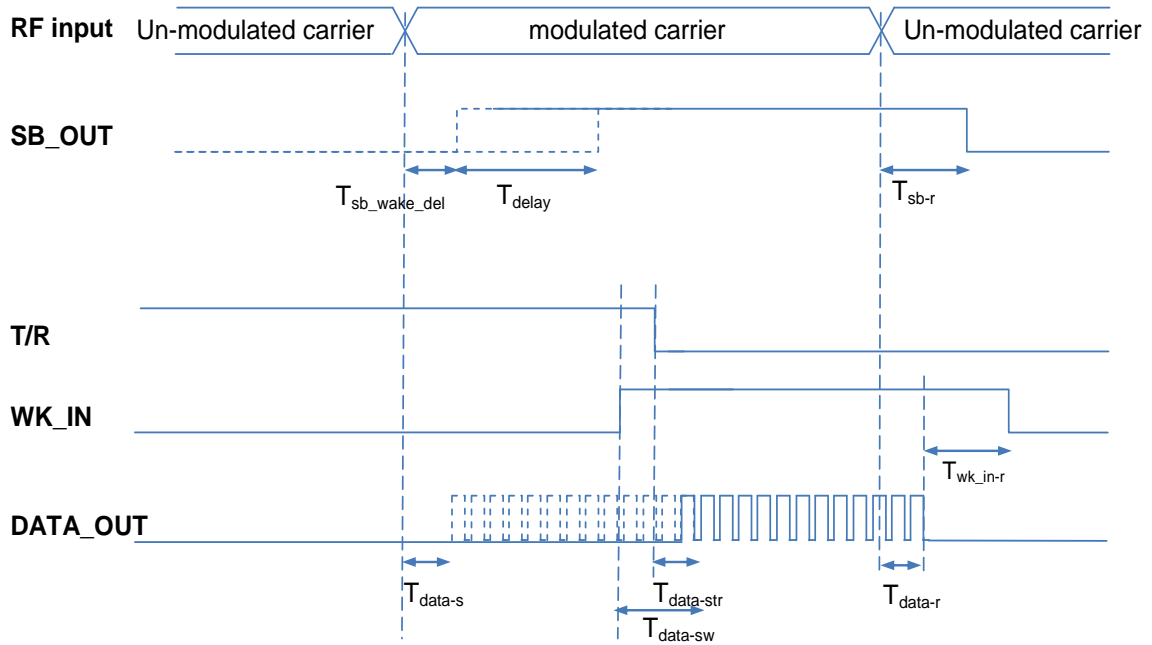
Tamb.= +25°C

Symbol	Parameter	Values	Unit
Vcc	Bbias voltage	>-0.3 & <4	V
WK_in_v	WK_in input port voltage	>-0.3 & <4 & <Vcc+0.3	V
T/R_v	Transmit / Receive input voltage	>-0.3 & <4 & <Vcc+0.3	V
MOD_v	MOD port input voltage	>-0.3 & <4 & <Vcc+0.3	V
RF_dl_p RF_ul_p	Maximum Standby, Downlink and Uplink RF input power on RF port	+5	dBm
Top	Operating temperature range	-40 to +90	°C
Tstg	Storage temperature range	-50 to +150	°C

⁽¹⁾ Operation of this device above anyone of these parameters may cause permanent damage.

Timing characteristics

Downlink mode



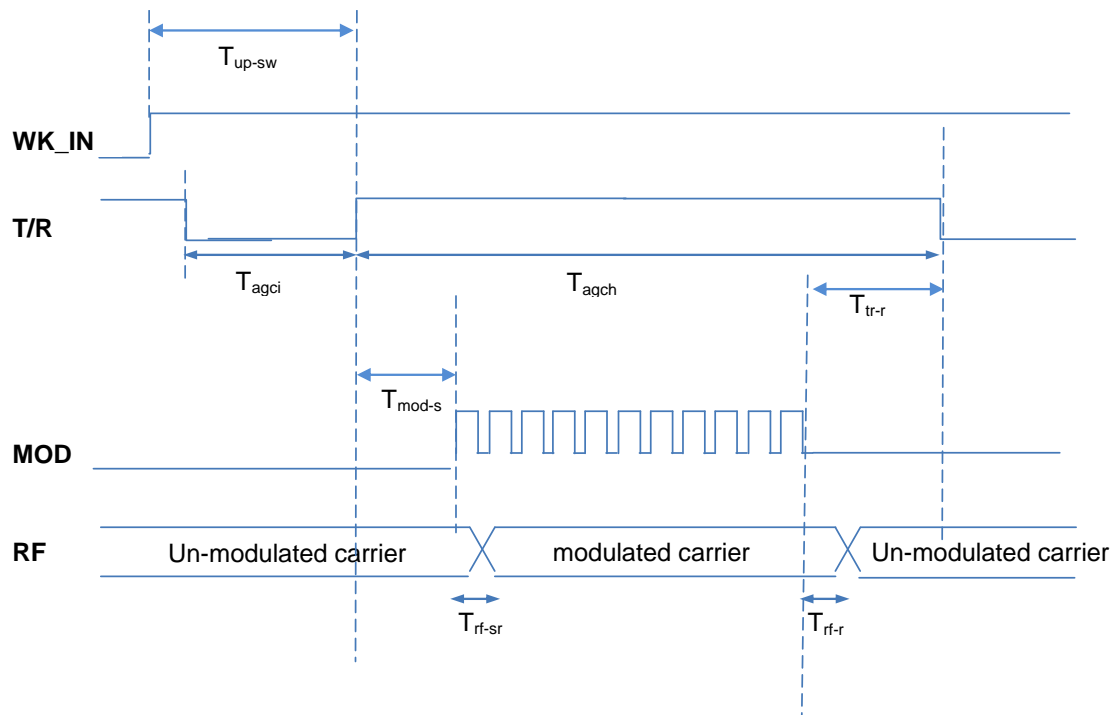
Parameter	MIN	TYP	MAX	UNIT	Condition
$T_{sb_wake_delay}$	12.5	25	50	μs	C_{delay} unconnected
T_{delay}	0		t	μs	Capacitor ($k*t$) pF on C_{delay}
T_{sb-r}			10	μs	
$T_{sb_cpt_delay}$	35	70	140	μs	
T_{sb_cpt-r}			10	μs	
T_{wk_in-r}	0			μs	
T_{data-s}			1	μs	
$T_{data-sw}$			30	μs	
$T_{data-str}$			30	μs	
T_{data-r}			1	μs	Data noise filters threshold settled with R on Sens_DT input to GND

Advanced Information



Timing characteristics

Uplink mode



Parameter	MIN	TYP	MAX	UNIT	Condition
T_{up-sw}	10			μs	
T_{agci}	10			μs	
T_{agch}			5000	μs	
T_{mod-s}	30			μs	
T_{rf-sr}			1	μs	
T_{rf-r}			1	μs	
T_{tr-r}	1			μs	

ADJUSTMENT FEATURES
STANDBY mode:
Wake-up digital sensitivity adjustment:

SB_S1	SB_S0	Typical Sensitivity
0	0	Nominal=RF_SB_P
0	1	RF_SB_P -2dB
1	0	RF_SB_P -4dB
1	1	RF_SB_P -6dB

Wake-up threshold increase:

R on Sens_SB to +Vcc	Typical Sensitivity
390 k Ω	Nominal=RF_SB_P
220 k Ω	RF_SB_P +2dB
100 k Ω	RF_SB_P +4dB
0 Ω	RF_SB_P +6dB

Wake-up Delay increase for filtering enforcement:

C on C_Delay to GND	Typical Time delay for Wake-up
Not Connected	Nominal=SB_wk_delay
10 pF	SB_wk_delay + 35 μ s
22 pF	SB_wk_delay + 75 μ s
47 pF	SB_wk_delay + 150 μ s

Advanced Information

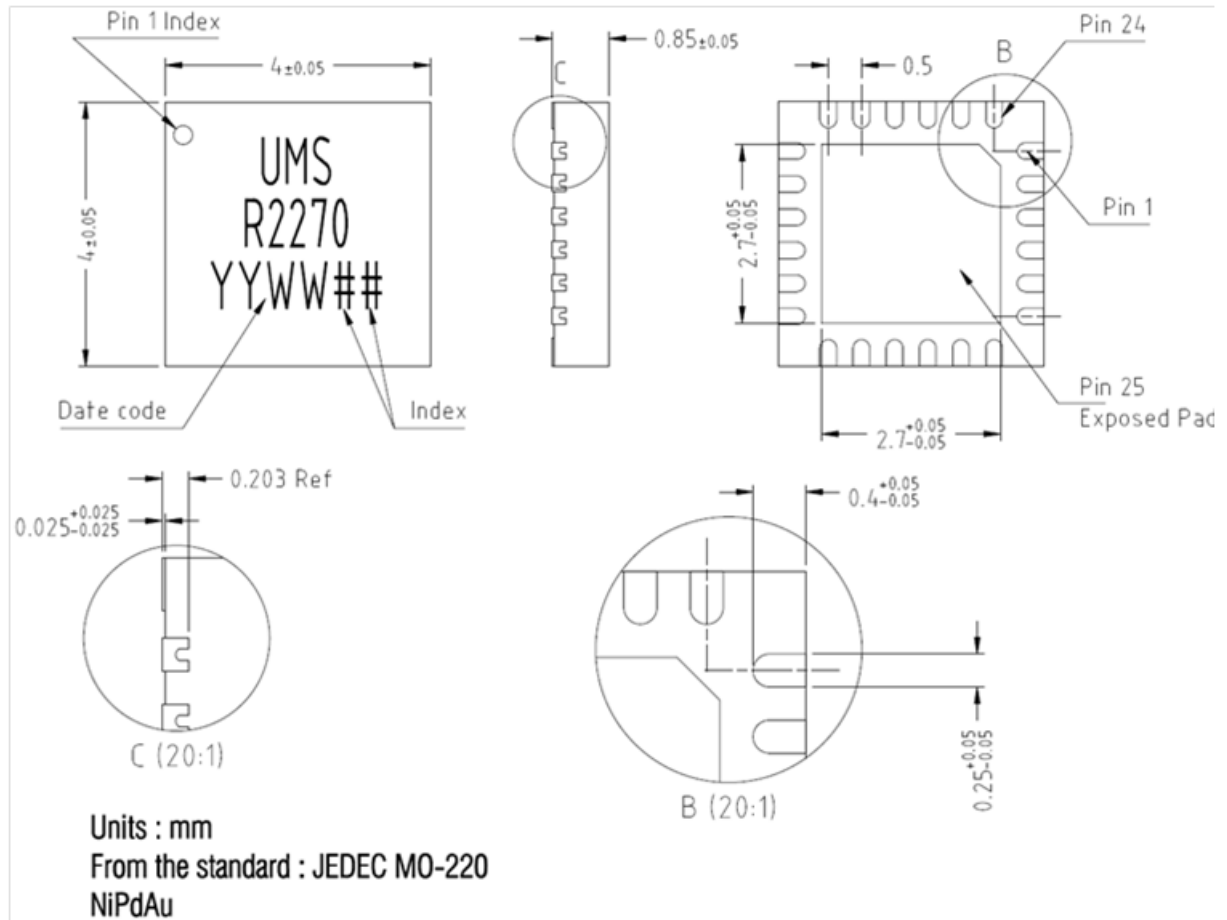
DOWNLINK mode:

DATA Noise filters threshold increase:

R on Sens_DT to GND	Typical Sensitivity
330 k Ω	Nominal=RF_DL_P
180 k Ω	RF_DL_P +2dB
100 k Ω	RF_DL_P +4dB
68 k Ω	RF_DL_P +6dB

Advanced Information

Package outline ⁽¹⁾



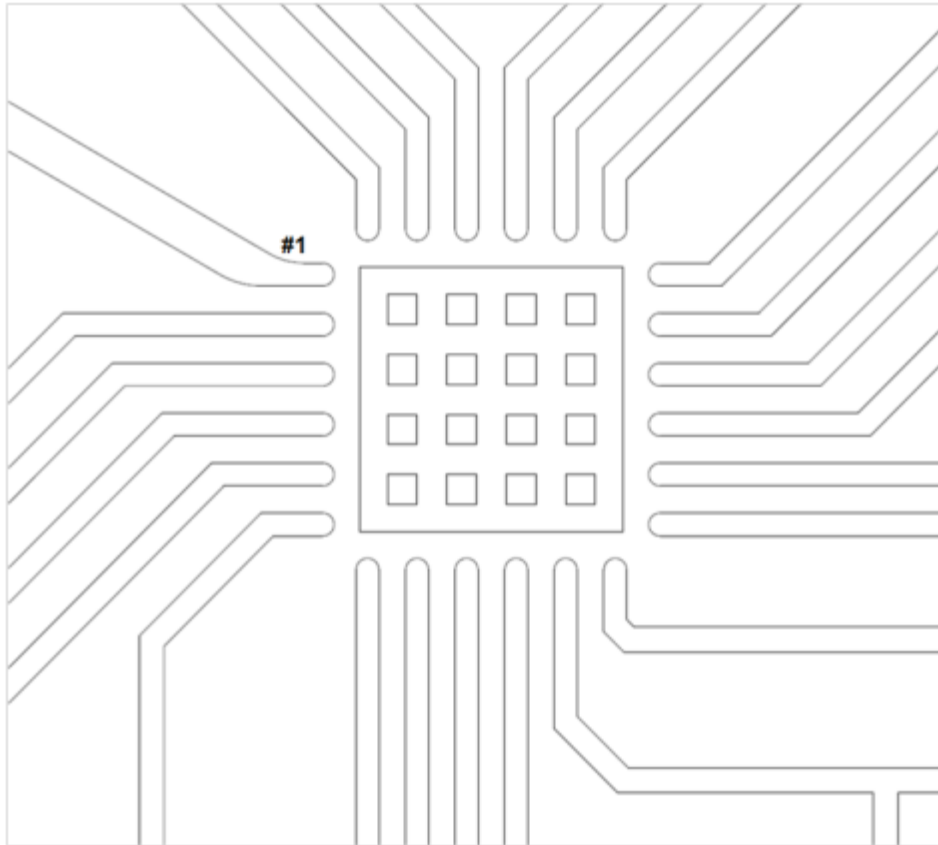
Matte tin, Lead Free	(Green)	1- RF	9- SB_S0	17- Nc
Units :	mm	2- T/R	10- SB_S1	18- IDLE
From the standard :	JEDEC MO-220	3- MOD	11- Vcc	19- Sens_DT
	(VGGD)	4- Gnd ⁽²⁾	12- Sens_SB	20- Nc
	25- Gnd ⁽²⁾	5- Vcc	13- Gc_SB ¹	21- WK_in
		6- Nc	14- C_delay	22- Cext1
		7- UL-Gc	15- SB_out	23- Nc
		8- Cext2	16- Data_out	24- Nc

⁽¹⁾ The package outline drawing included to this data-sheet is given for indication. Refer to the application note AN0017 (<http://www.ums-gaas.com>) for exact package dimensions.

⁽²⁾ It is strongly recommended to ground all pins marked “Gnd” through the PCB board. Ensure that the PCB board is designed to provide the best possible ground to the package.

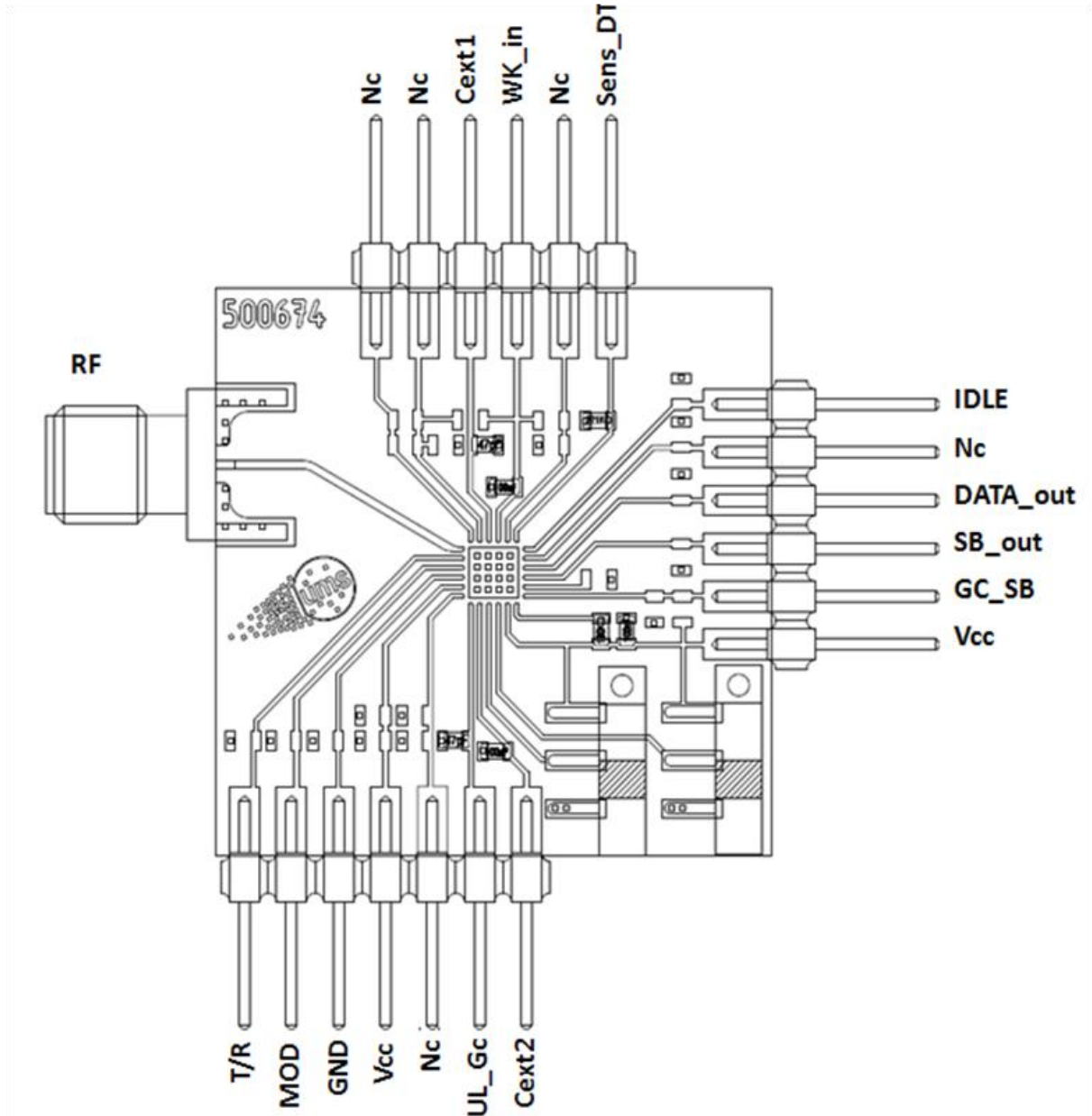
Advanced Information

CHR2270 QFN-24L PACKAGE RECOMMENDED PCB FOOT PRINT



Advanced Information

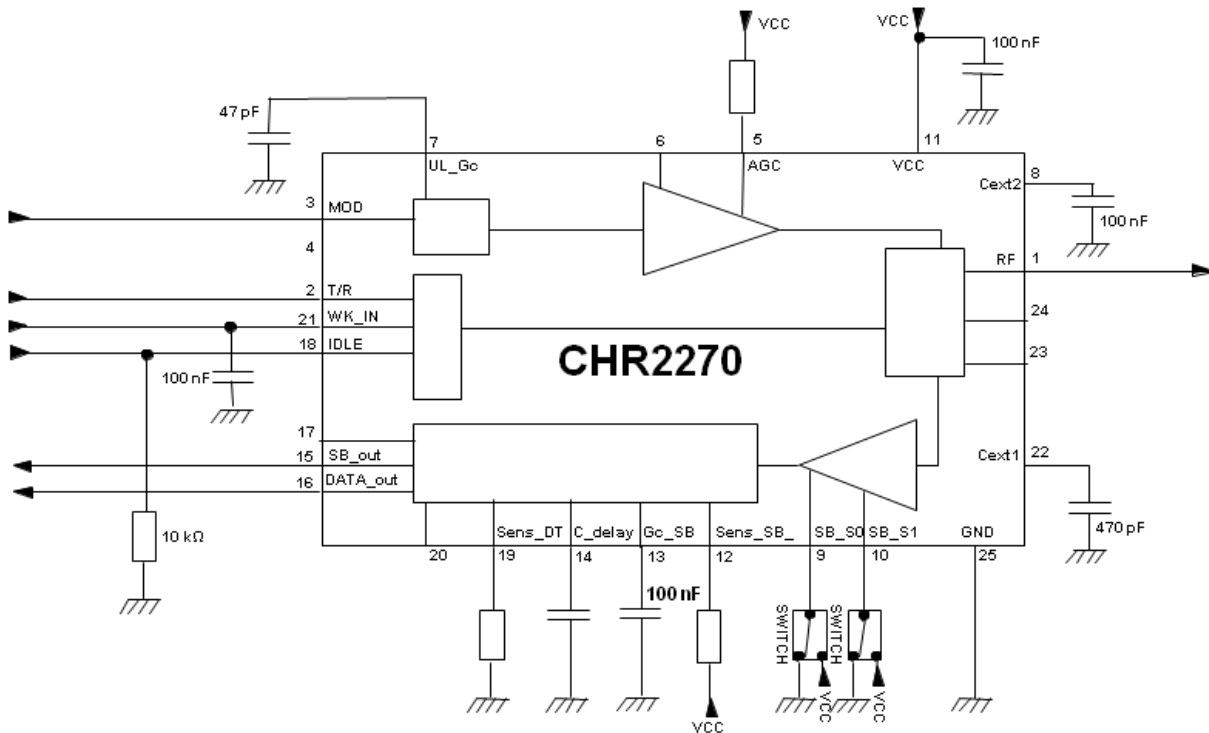
CHR2270 EVALUATION BOARD



Advanced Information

CHR2270 EXTERNAL COMPONENTS

See “Specifications” and “ADJUSTMENT FEATURES” for appropriate values.



Advanced Information

5.8GHz TRANSPONDER

AI1232
July 2015

Notes

Advanced Information

Ref. : AI12327191 - 10 Jul 17

13/13

Subject to change without notice

Bât. Charmille - Parc SILIC - 10, Avenue du Québec - 91140 VILLEBON-SUR-YVETTE - France
Tel.: +33 (0) 1 69 86 32 00 - Fax: +33 (0) 1 69 86 34 34

